Earth Science Enterprise

Science for Society

ESSAC Meeting

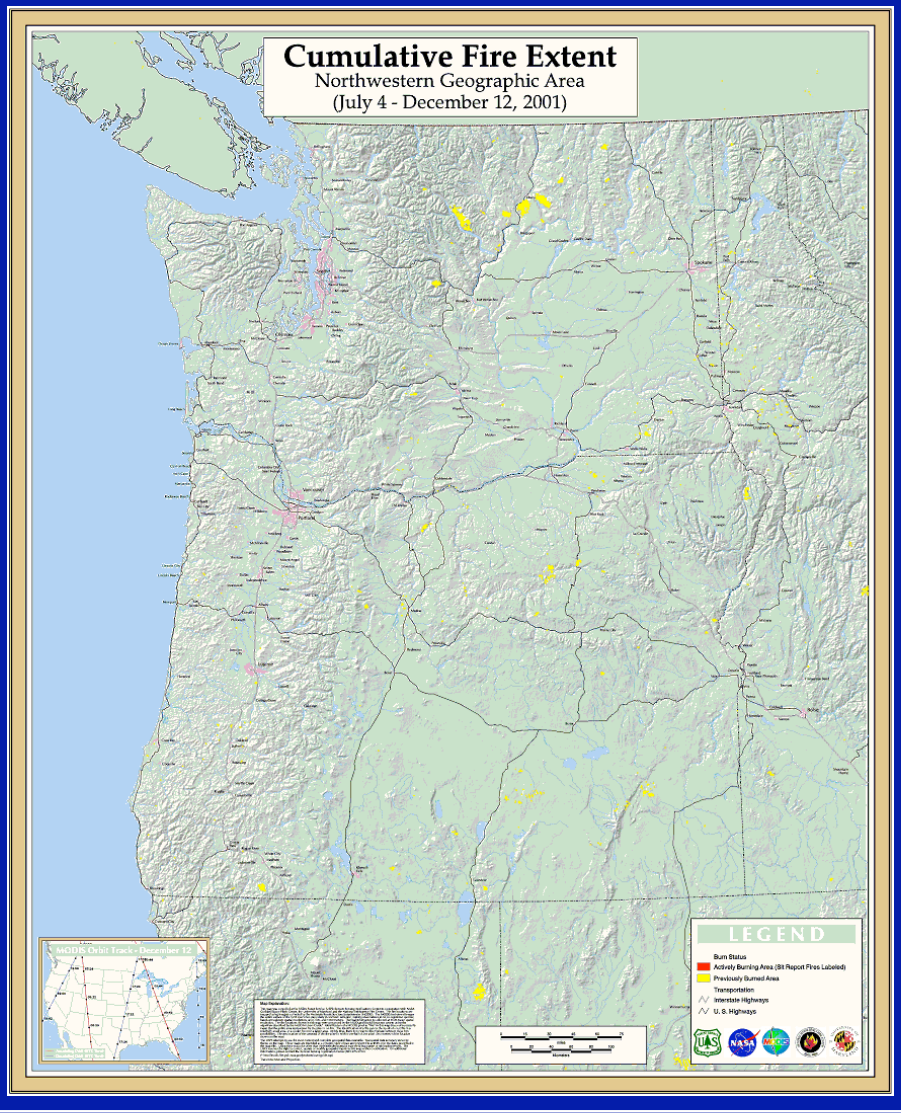
November 14, 2002

"Accelerating the realization of economic and societal benefits from Earth science, information, and technology …"

Earth Science Applications

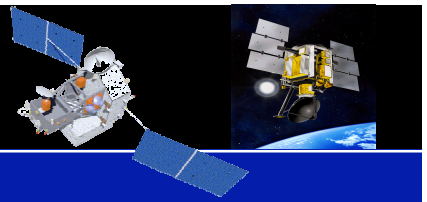
- FY02 Accomplishments
  - Wildfires, Weather Prediction, Aviation, Data Buy
- NAS Review Findings & Next Steps
  - Endorse strategy, recommend emphasis on partnerships
- Partnerships and Decision Support Systems
  - USDA, NOAA, FAA, USGS, FEMA, DOT, CDC, NIH, EPA, DOE
- SENH – FY02 Applications Projects
  - 10 projects selected
- REASON CAN
  - 175 participants at pre-proposal conference

Managing Wildfires



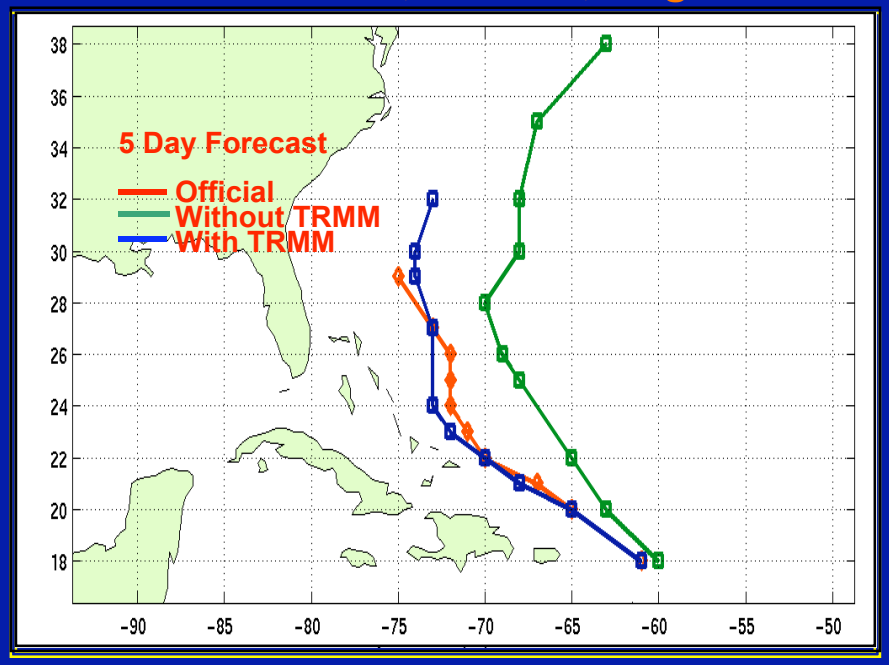
The US Forest Service has established two direct broadcast receiving installations to acquire Terra satellite data, and enable daily, near real-time distribution and decision making on allocation of fire fighting assets.

Improving Hurricane Track Forecasts



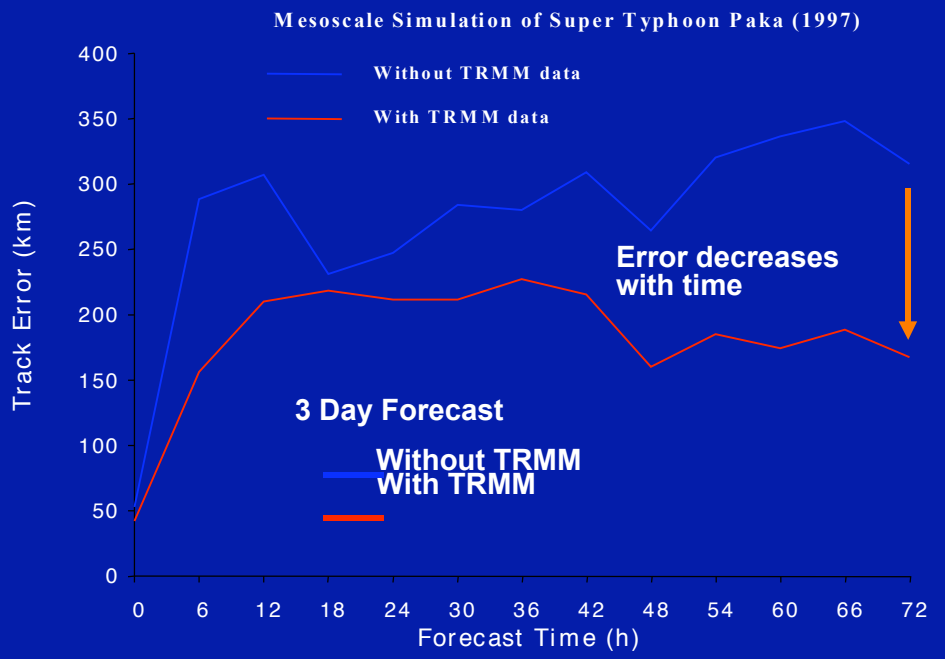
Assimilation of TRMM rainfall location, intensity and vertical structure into hurricane forecast models leads to improvements in forecasts of future position

Hurricane Bonnie, Atlantic, Aug 1998



Dr. A. Hou, NASA DAO

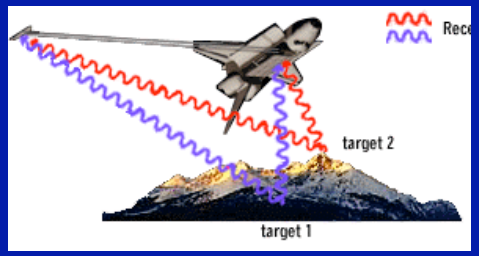
Typhoon Paka, Pacific, Dec 1997

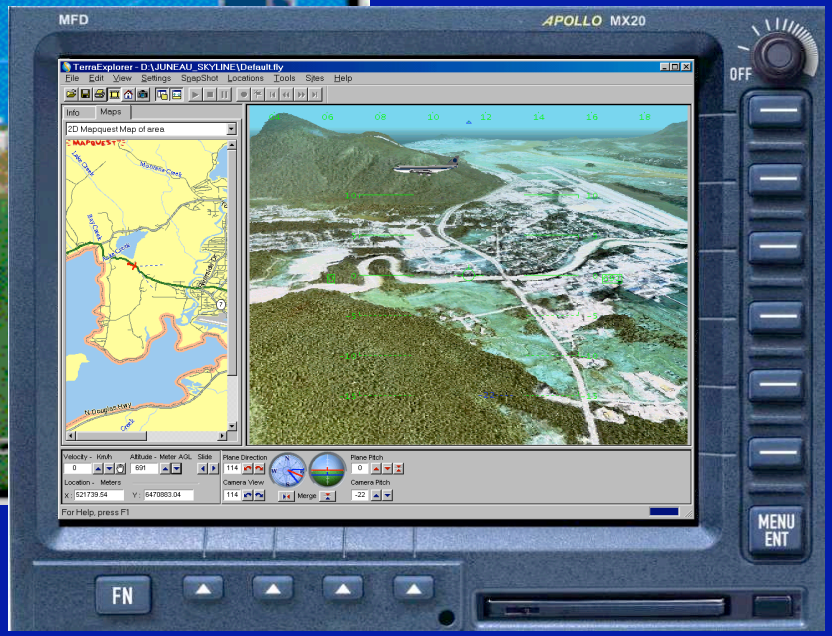


Dr. X. Pu, NASA GSFC

Reduced track errors can save money ($600,000 per mile of coast evacuated) and save lives by more precise prediction of eye location at landfall

Benchmarking Guidelines for Aviation





- Digital Terrain Data

Purpose (Elevator speech)

- NASA Earth Science Enterprise Applications
  - conducts research and development of aerospace science and technology
  - to increase knowledge of the Earth system
  - to improve decision support tools to serve society.

NASA provides systems engineering and scientific research to Earth system science solutions focused on national priorities -- including economic security and homeland security.

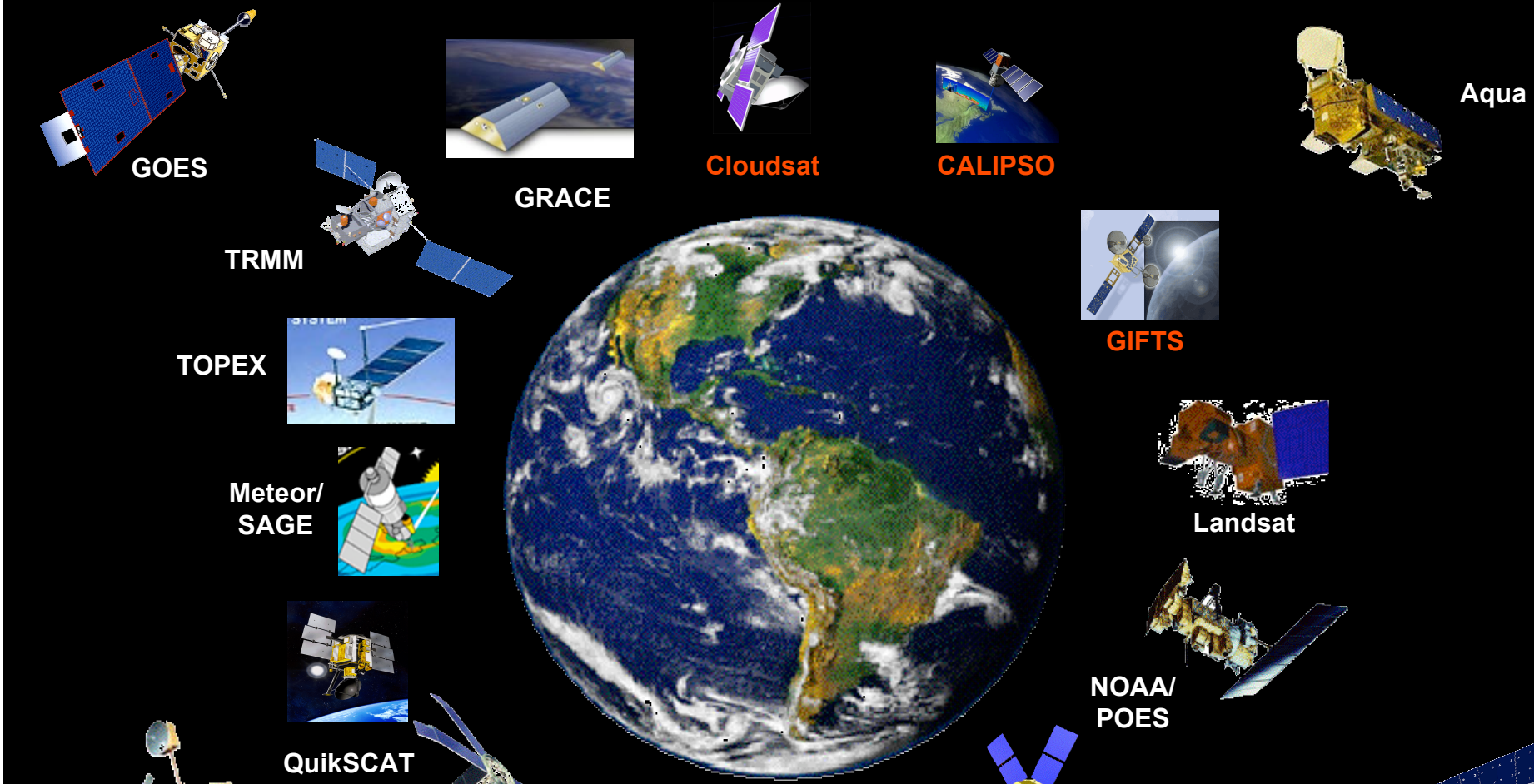
Approach

- Focus on national priorities requiring global understanding
  - finite number of discrete applications
- Employ “Systems Approach”
  - missions, models, decision support systems
- Leverage investments in NASA research and development of missions and models (~$15B over 10+ years)
  - as outputs
- Leverage investments in Federal Agencies and national organizations in decision support tools (on the order of $1B per year)
  - existing requirements for inputs
- Contribute systems engineering resources to assimilate NASA outputs as decision support system inputs
  - Evaluation, verification and validation, benchmark

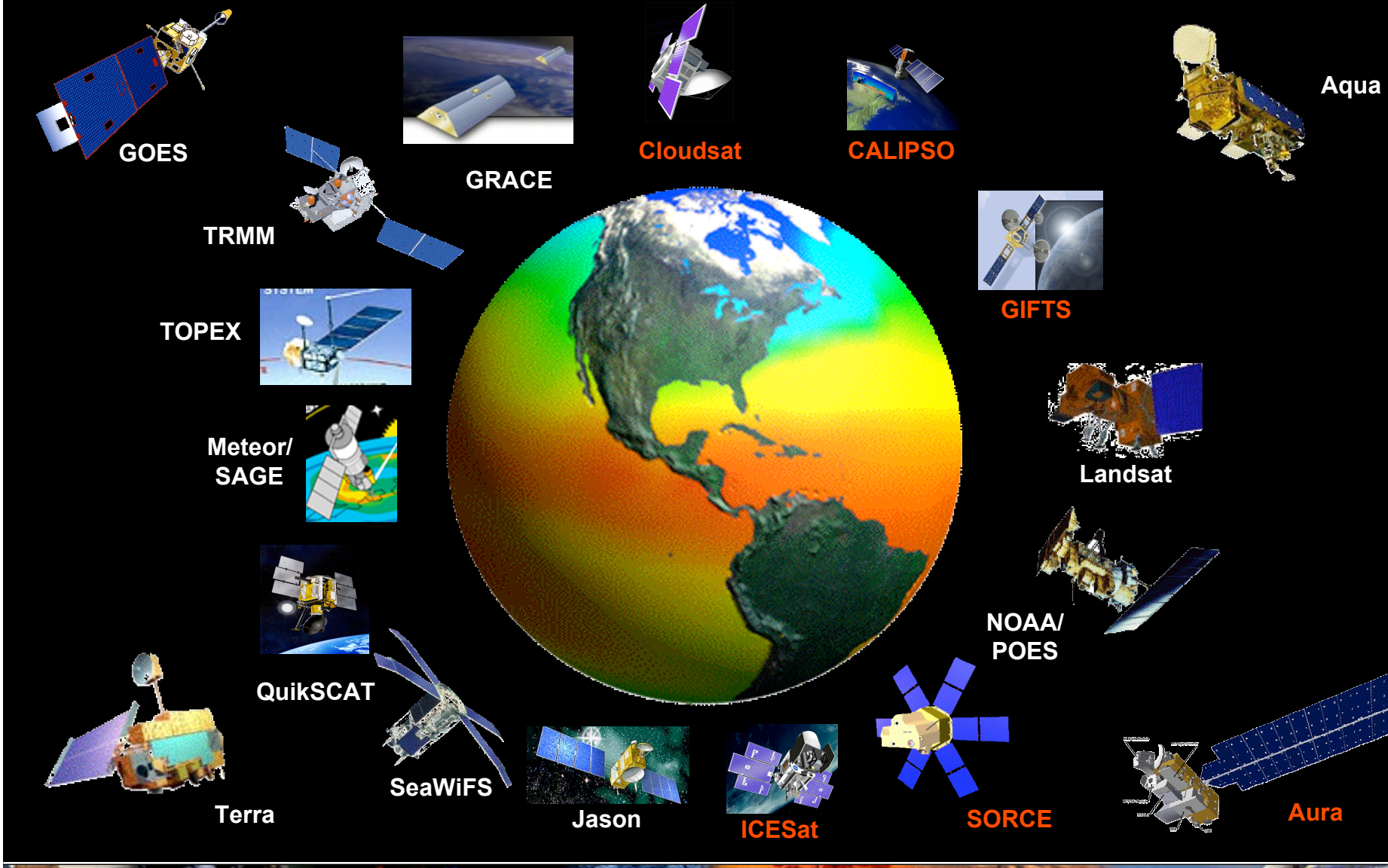
Expectations

- Commonly recognized architecture for systems approach – throughout the Earth science community
- Strategy that is understood and supported by White House and Congress
- Common understanding of program by stakeholders in the 8 (or more) different sectors that have expectations of NASA ESE
- Recognized collaboration between/amongst NASA and partner agencies to address advanced solutions based on Earth system science and Earth observations
- Improved economic and homeland security manifest through enhanced operational decision support tools serving society
- Products/Results – benchmarks for improvements in operational decision support tools

Constellation: Global Measurements



Constellation: Global Measurements



Constellation: Global Measurements